

ABSTRACT OF THE DISCLOSURE

A plasma processing method for etching a sample having a gate oxide film which generates a plasma in a vacuum chamber using electromagnetic waves, applies an rf bias power to the sample, turns off the rf bias power before a charged voltage of the sample reaches a breakdown voltage of the gate oxide film, turns on the rf bias power after the charged voltage of the sample has substantially dropped and repeats the turning on and off of the rf bias power to process the sample. The off-time is set at least longer than the on-time, and the plasma is generated by continuously supplying power to enable generation of the plasma during the repeated turning on and off of the rf bias power.